CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/SLPEPL/W.No.11/CSR-10/465b/CEMENT/2017-18 Date: 16.10.2017

TEST REPORT ON CEMENT

*** Customer**	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
*** Agency**	:	**M/s. S.L.P Infra Engineers Pvt Ltd.,** Bangalore.
*** Name of Work**	:	Asphalting from Varadarajanagara to Lakshmipura connecting road in Ward No.11 (Kuvempunagara) in Vidyaranyapura Sub Division (Devappa Layout Asphalt Road), BBMP, Bangalore.
*** Reference**	:	EE/BTP/W.O/293/2016-17 Dated: 03.01.2017
*** Sample ID**	:	Cement – Sample 2
Sample Received on	:	14.10.2017
Period of Testing	:	14.10.2017 to 16.10.2017

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988 (RA-2014)	29.00 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988 (RA-2014)	150 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988 (RA-2014)	475 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988 (RA-2014)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/SLPEPL/W.No.11/CSR-10/465b/SAND-Gradation/2017-18 16.10.2017

TEST REPORT ON SIEVE ANALYSIS OF FINE AGGREGATES

* Customer	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
* Agency	:	**M/s. S.L.P infra Engineers Pvt Ltd.,** Bangalore.
* Name of Work	:	Asphalting from Varadarajanagara to Lakshmipura connecting road in Ward No.11 (Kuvempunagara) in Vidyaranyapura Sub Division (Devappa Layout Asphalt Road), BBMP, Bangalore.
* Reference	:	EE/BTP/W.O/293/2016-17 Dated: 03.01.2017
* Sample ID	:	Fine Aggregates - Sample 2
Technical Reference	:	IS : 2386 (Part 1) - 1963 (RA-2011)
Sample Received On	:	14.10.2017
Date of Testing	:	16.10.2017

Total Wt. of Aggregates in gms = **1000**

IS Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2011)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	96.40	90-100	90-100	90-100	95-100
2.36	76.60	60-95	75-100	85-100	95-100
1.18	56.60	30-70	55-90	75-100	90-100
600 Micron	20.60	15-34	35-59	60-79	80-100
300 Micron	12.40	5-20	8-30	12-40	15-50
150 Micron	6.80	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

Remarks : This sample is under Zone-I specific limits.

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Job No.: CTCE/BBMP/SLPEPL/W.No.11/WMM/Gradation/2017-18

05.10.2017

TEST REPORT ON GRADATION OF WET MIX MACADAM

* Customer	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
* Agency	:	**M/s. S.L.P infra Engineers Pvt Ltd.,** Bangalore.
* Name of Work	:	Asphalting from Varadarajanagara to Lakshmipura connecting road in Ward No.11 (Kuvempunagara) in Vidyaranyapura Sub Division (Devappa Layout Asphalt Road), BBMP, Bangalore.
* Reference	:	EE/BTP/W.O/293/2016-17 Dated: 03.01.2017
Sample ID	:	Wet Mix Macadam
Technical Reference	:	IS 2386 (part-1)1963 (RA-2011)
Date of Testing	:	05.10.2017

Oven Dry Wt (gm): **5000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits As per Morth Table 400-13
53	0	0	0	100	100
45	165	165	3.3	96.7	95-100
22.4	1525	1690	33.80	66.20	60-80
11.2	1050	2740	54.80	45.20	40-60
4.75	600	3340	66.80	33.20	25-40
2.36	435	3775	75.50	24.50	15-30
0.600	585	4360	87.20	12.80	8-22
0.075	520	4880	97.60	2.40	0-8

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Job No.: CTCE/BBMP/SLPEPL/W.No.11/WMM/AIV/2017-18 05.10.2017

TEST REPORT ON IMPACT VALUE OF AGGREGATE

*** Customer**	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
*** Agency**	:	**M/s. S.L.P infra Engineers Pvt Ltd.,** Bangalore.
*** Name of Work**	:	Asphalting from Varadarajanagara to Lakshmipura connecting road in Ward No.11 (Kuvempunagara) in Vidyaranyapura Sub Division (Devappa Layout Asphalt Road), BBMP, Bangalore.
*** Reference**	:	EE/BTP/W.O/293/2016-17 Dated: 03.01.2017
*** Sample ID**	:	Wet Mix Macadam
Technical Reference	:	IS : 2386(Part -4)-1963 (RA-2011)
Date of Testing	:	05.10.2017

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	80	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	302	
4	Aggregate Impact value = percent fines 100* (W2/W1)%	20.58	20.94	**20.76**

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Impact value for Wet Mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/SLPEPL/W.No.11/WMM/Shape.T/2017-18 05.10.2017

TEST REPORT ON FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

*** Customer**	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
*** Agency**	:	**M/s. S.L.P Infra Engineers Pvt Ltd.,** Bangalore.
*** Name of Work**	:	Asphalting from Varadarajanagara to Lakshmipura connecting road in Ward No.11 (Kuvempunagara) in Vidyaranyapura Sub Division (Devappa Layout Asphalt Road), BBMP, Bangalore.
*** Reference**	:	EE/BTP/W.O/293/2016-17 Dated: 03.01.2017
*** Sample ID**	:	Wet Mix Macadam
Technical Reference	:	IS 2386(Part 1) 1963 (RA 2011)
Date of Testing	:	05.10.2017

Sl.No.	Description	Result
1	Flakiness Index	11.90%
2	Elongation Index	13.68%
3	Combined Flakiness & Elongation Index	25.58%

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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Job No: CTCE/BBMP/SLPEPL/W.No.11/BC/Bitumen/2017-18 26.10.2017

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

As per IS2386 and IRC:SP:11-1984

* Customer	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
* Agency	**M/s. S.L.P Infra Engineers Pvt Ltd.,** Bangalore.
* Name of Work	Asphalting from Varadarajanagara to Lakshmipura connecting road in Ward No.11 (Kuvempunagara) in Vidyaranyapura Sub Division (Devappa Layout Asphalt Road), BBMP, Bangalore.
* Reference	EE/BTP/W.O/293/2016-17 Dated: 03.01.2017
* Sample ID	Road from Varadarajanagara to Lakshmipura connecting road in Ward
DATE OF TESTING	26.10.2017

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	470	469
3. Weight of Asphalt and Mineral matter Extracted, g	30	31
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	30	31
7. Bitumen content in %	6.00	6.20
8. Average	**6.10**	

GRADATION AFTER EXTRACTION

TABLE - 1

SIEVE SIZE	Percent Passing, %		JOBMIX
mm	Sample 1	Sample 2	Gradation
19	100.00	100.00	100
13.2	86.35	89.36	79-100
9.5	83.25	82.23	70-88
4.75	65.25	65.32	53-71
2.36	47.23	49.96	42-58
1.18	35.26	39.33	34-48
0.6	29.36	30.23	26-38
0.3	26.32	25.25	18-28
0.15	16.33	17.23	12-20
0.075	5.90	6.32	4-10

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Job No.: CTCE/BBMP/SLPEPL/W.No.11/BC/AIV/2017-18 26.10.2017

TEST REPORT ON IMPACT VALUE OF AGGREGATES

* Customer	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
* Agency	:	**M/s. S.L.P Infra Engineers Pvt Ltd.,** Bangalore.
* Name of Work	:	Asphalting from Varadarajanagara to Lakshmipura connecting road in Ward No.11 (Kuvempunagara) in Vidyaranyapura Sub Division (Devappa Layout Asphalt Road), BBMP, Bangalore.
* Reference	:	EE/BTP/W.O/293/2016-17 Dated: 03.01.2017
* Sample ID	:	Hot mix plant, Bangalore.
* Type of Mix	:	Bituminous Concrete
Technical Reference	:	IS: 2386 (Part- 4)-1963 (RA-2011)
Date of Testing	:	26.10.2017

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	80	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	302	
4	Aggregate Impact value = percent fines 100* (W2/W1) percent	20.58	20.94	**20.76**

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/SLPEPL/W.No.11/BC/Shape.T/2017-18 26.10.2017

TEST REPORT ON FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

*** Customer**	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
*** Agency**	:	**M/s. S.L.P Infra Engineers Pvt Ltd.,** Bangalore.
*** Name of Work**	:	Asphalting from Varadarajanagara to Lakshmipura connecting road in Ward No.11 (Kuvempunagara) in Vidyaranyapura Sub Division (Devappa Layout Asphalt Road), BBMP, Bangalore.
*** Reference**	:	EE/BTP/W.O/293/2016-17 Dated: 03.01.2017
*** Sample ID**	:	Hot mix plant, Bangalore
Technical Reference	:	IS : 2386(Part -1)-1963 (RA-2011)
*** Type of Mix**	:	Bituminous Concrete
Date of Testing	:	26.10.2017

Sl.No.	Description	Result
1	Flakiness Index	12.95%
2	Elongation Index	13.60%
3	Combined Flakiness & Elongation Index	26.55%

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/SLPEPL/W.No.11/BC/Stripping/2017-18 26.10.2017

TEST REPORT ON STRIPPING VALUEOF ROAD AGGREGATES (STATIC IMMERSION TEST)

*** Customer**	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
*** Agency**	:	**M/s. S.L.P Infra Engineers Pvt Ltd.,** Bangalore.
*** Name of Work**	:	Asphalting from Varadarajanagara to Lakshmipura connecting road in Ward No.11 (Kuvempunagara) in Vidyaranyapura Sub Division (Devappa Layout Asphalt Road), BBMP, Bangalore.
*** Reference**	:	EE/BTP/W.O/293/2016-17 Dated: 03.01.2017
Technical Reference	:	IS: 6241
*** Type of Mix**	:	Bituminous Concrete
Date of Testing	:	26.10.2017

Type of binder : 60/70
Percentage of binder used : 5.00% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.00 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	2.9	3.07	96.93
2	3.1		
3	3.2		

*Information is furnished by the Customer/Representative.

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/SLPEPL/W.No.11/BC/Sp_Wa/2017-18 26.10.2017

TEST REEPORT ON SPECIFIC GRAVITY AND WATER ABSORPTION

* Customer	:	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
* Agency	:	**M/s. S.L.P Infra Engineers Pvt Ltd.,** Bangalore.
* Name of Work	:	Asphalting from Varadarajanagara to Lakshmipura connecting road in Ward No.11 (Kuvempunagara) in Vidyaranyapura Sub Division (Devappa Layout Asphalt Road), BBMP, Bangalore.
* Reference	:	EE/BTP/W.O/293/2016-17 Dated: 03.01.2017
* Sample ID	:	Hot mix plant, Bangalore
Technical Reference	:	IS : 2386(Part -3)-1963 (RA-2011)
* Type of Mix	:	Bituminous Concrete
Date of Testing	:	26.10.2017

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2008	2009	2010	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1239	1238	1255	
4	Weight of saturated surface dry aggregate in air	W_3 g	2005	2006	2007	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	766	768	752	
6	Weight of oven dried aggregate	W_4 g	1999	1995	1994	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.610	2.598	2.652	2.620
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.630	2.635	2.698	2.655
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.30%	0.55%	0.65%	0.50%

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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